

Loxahatchee River District

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Richard C. Dent, Executive Director



*Award Winning
Regional Wastewater Facility
Best in Nation, E.P.A.
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July 29, 2002

Mr. John G. Zahina
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33416

Re: Loxahatchee River and Estuary MFL

Dear John,

Don't Panic!! I think you'll appreciate most of these comments.

Thank you for the opportunity to review the referenced document. Given the 'just hold the line' directive, I believe the Water Management District staff has done a good job of describing the methodology employed and developing reasonable technical criteria.

Enclosed is my initial list of comments and questions relative to the draft technical document. While I have included certain opinions concerning the policy nature of decisions under which the draft was developed, my major intent is to assist in clarifying and enhancing the technical efficacy of your effort. I have also enclosed several other technical references that may be useful.

John, please give me a call to arrange a meeting at your convenience to go over the issues presented. Thanks again for a job well done.

Sincerely,

Richard C. Dent
Executive Director

Encls.

/dh

1. **Maximum flows, River** -- the reference to maximum flows is incomplete with information omitted on the third line up from the bottom of page 1.
2. **Maximum flows, C-18** -- given that the title speaks to the estuary, the need to set a flow limit through the s-46 structure should be further discussed and scheduled for future consideration.
3. **Seasonal flows** -- the exploration of seasonal flow minimums and consideration for future MFL inclusion is encouraged and further mention, beyond that contained in the MFL document, is requested.
4. **MFL definition** -- references in the executive summary, on page 3 and elsewhere in the document tend to imply that the 'significant harm' criteria is the only definition provided by law. Perhaps a clarification that this definition is the one that staff has been tasked with using would be helpful.
5. **Recovery and prevention strategy** -- since the river is the resource sought to be protected by the MFL and the subject of the technical document, perhaps priority and emphasis on page 7, paragraph 3, and elsewhere (Chapter 6) should be modified. State that the goal is 'to take actions to achieve the MFL criteria, while providing sufficient...'.
6. **Rainfall A** -- reference to a Jupiter rainfall record of 90 or 95 years, as given in the narrative and Figure 3 on page 11, may be misleading. My understanding is that the record prior to 1960 is incomplete.
7. **Rainfall B** -- the enclosed report on rainfall contains much of the same information developed by the SFWMD. However, two observations in the 1997 document may be helpful. First, the spatial distribution of rainfall in the watershed is very important and not considered in the MFL document. Pages 7 and 8 of the enclosed report documents significant wet season variances in rainfall amounts between eastern and western locations. Since future modeling will be rainfall driven, this factor should be incorporated. The second observation relates to rainfall frequency and intensity. Light rainfall events do not greatly add to storage as much is lost to evapotranspiration and, extreme events are difficult to effectively capture for storage.
8. **Tributary flows** -- Table 1 on page 17 indicates that flow data from Cypress Creek and Hobe Groves Ditch are available for a continuous POR through 1991. Please help me find the full 1981-1991 record (perhaps it is in one of the appendices).
9. **Tidal prism** -- the USGS data referenced on page 18 is valid but differs somewhat from the referenced work by Chiu found on page 22.
10. **Groundwater inflow A** -- Although the contribution of groundwater flow is addressed later in the MFL document, perhaps references to total freshwater flow on pages 19, 20 and 21 should clarify surface water contributions only. Discussions on page 97 could also benefit from this clarification.
11. **Loxahatchee estuary** -- the narrative on the estuary presented on pages 22 through 30 contains several references to upstream areas, JD Park, floodplain swamp community, etc.
12. **Submerged aquatic vegetation** -- the discussion on Johnson's seagrass on page 26 is important and further research has been published. The enclosed report by Ridler, et al is a follow up to the 1999 research and documents the continued presence of this threatened species within the estuary. Further consideration of this plant, possible as an indicator for future MFL rules, is encouraged.

13. **Benthic macrofauna** -- in addition to the estuarine data referenced, the LRD has also presented information in the wild and scenic reach of the river. Although not yet published, the results of the freshwater research were presented at the 2001 Loxahatchee River Symposium and the abstract and salient graphics are enclosed. In general terms, the two stations (at Trapper's and at Lainhart) show healthy freshwater communities and compare favorably with earlier work conducted by Rudolph. As relates to future research, perhaps the use of select members of the macrofauna could be used as a 'miner's canary' at certain locations in the river.
14. **G-92 structure and C-14 canal** -- several references on pages 32, 33 and 34 are inconsistent with my recollection. The initial installation of the culvert in the mid 1970's was of a structure designed for 50 cfs sustained and 100 cfs maximum. I know of no enlargement that occurred until 1987. Further, references to the C-14 canals construction time and enhancement might be checked with Gale English for accuracy.
15. **Treated wastewater** -- this reference on page 32 would be more accurate if changed to reflect 'AWT' treated wastewater, gallons per day, the presence of a recharge lake employed to discharge the water and a discontinued date of 1986.
16. **Groundwater inflowB** -- very preliminary research on groundwater inflows to the estuary was conducted by the LRD in the 1980's by use of seepage meters. Recognizing the recent criticisms of this methodology, the data may not be useful when considering references such as page 38 or page 68, but it is available if needed.
17. **Reclaimed water** -- the comment on page 44 stating that unused water is disposed might better read 'is stored for later use or disposed of by deep injection well.'
18. **Water quality A** -- the comprehensive monitoring program discussed on pages 45 and 46 is conducted every other month, not twice each month. The addition of a phrase 'and is updated every six months' at the end of the first paragraph on page 46 would be appreciated. As relates to the Florida Water Quality Index, reports updating the index through 2001 are available. A second index employed for estuaries in Florida is the Trophic State Index (TSI). One of the enclosed documents speaks to this index as it applies to the Loxahatchee. Of special note is an observation that the estuary may be phosphorus limited (as relates to trophic state and productivity) and that new discharges to the system should be evaluated for excessive phosphorus. As relates to future research, the continued monitoring of trophic levels and phosphorus is suggested.
19. **Water quality B** -- the enclosed document of dissolved oxygen describes a problem in the upper reaches of the wild and scenic river and targets cause. Given the need to show that MFL induced changes will favorably impact the water quality, the topic of this report may be helpful. Essentially, it shows that C-18 water discharged to the river through the G-92 structure provides an improvement as relates to D.O. Perhaps inclusion of this observation, either on page 68 or in the research section could be beneficial.
20. **Cypress / Salt** -- the sentence 'occasional inundation by slightly saline surface water probably does not result in serious long-term impacts' is too subjective for a technical document of this caliber.
21. **Plants and Animals** -- the reference to diversity on page 51 should qualify the type of organisms identified. For instance, adult insects are not, nor should be, included. This comment also applies to page 61.
22. **Recreation** -- the discussion of facilities on page 55 should mention the present role of the Canoe Outfitters in Riverbend Park.

23. **Other Plans** -- on page 58 and prior pages, a summary of the Loxahatchee river watershed management plan is provided. Perhaps a similar reference to the Wild and Scenic river management plan would be useful.
24. **Water supply** -- this section beginning on page 62 could be improved by a more detailed discussion of agricultural water use.
25. **Water classification** -- there continues to be inconsistency on the extent of the Class II waters in the watershed. Table 14 on page 67 indicates that the whole of the northwest fork is Class II whereas the reference on page 71 is for Class III. This inconsistency should be resolved in favor of the freshwater reach of the northwest fork designated as Class III.
26. **Consumptive uses A** -- the comment on page 68 that the effects of these uses are 'not very large' should be better quantified given the analytical work on the existing data. If the reference to 5cfs on page 107 speaks to the same issue, a rationale for reaching the conclusion is lacking.
27. **River miles** -- Table 15 on page 77 and the graphic on page ?? clarify what has been an undesired variable. Thanks!
28. **Modeling assumptions** -- on page 79, the selection to use a constant when relating discharge fractions from tributaries to the Lainhart dam fails to make use of available data. Specifically, the seasonal fluctuations in the relative contributions as described by McPhearson in his early 1980's work. Additionally, the basis for the constant assumption of 40 cfs from groundwater is not explained.
29. **Mean daily salinity** -- references to this value is made on pages 80, 92, 145 and elsewhere. Given that the raw data on salinity was developed using maximum bottom salinities, an explanation of why and how the conversion was made is needed.
30. **Soil salinity** -- the concentration changes referenced on page 86 appear to be spatial, not temporal, and should be so specified.
31. **Statistical analyses** -- perhaps a review of Appendix D would help resolve my ignorance. As it is, however, I don't know what the paragraph on page 87 means.
32. **Model progression** -- the discussion of models included in the MFL document is not simple to understand. However, the reliance of one model on the results of the prior model appears weak to one not formally trained in modeling. Model 1 converts actual salinity data to simulated salinity data, the new salinity data is extrapolated over time by a second model, then subjected to the Ds/Db model. This ration is then incorporated into a fourth model relating to vegetation (and, I may have missed a model). Perhaps a better explanation of the relationships will provide clarity and confidence.
33. **Literature review A** - A report entitled 'Loxahatchee River Salinity Monitoring Program' (unpublished) was presented to the Loxahatchee River Management Coordinating Council in 1994. This document, certain graphics of which are enclosed, offered the opinion and supporting data that 50 cfs was insufficient to meet stated goals. To the extent that the new flow goals were accepted, the comment on page 96 that 'as late as 1998, the original USGS flow target of 50 cfs' Can be questioned.
34. **Literature review B** -- The reference at the top of page 96 slightly misstates the conclusion of the 1997 report. A minimum flow rate of 75 cfs was 'recommended' and seasonal minimum flows and maximum flow range were 'suggested'.
35. **G-92 flow** -- Figure 19 on page 98 is very descriptive of the improved flow capabilities. The major reason for this is less clear however, A more complete explanation of the

- culvert enlargement from 100 cfs to 400 cfs is warranted. As an aside, how can the 721 cfs measurement be accurate given the max design?
36. **Consumptive uses B** -- the identification of uses with the potential impact to the river is incomplete. Given that the Loxahatchee slough, in either its current or proposed configuration, is integrally connected with the C-18 canal, then considering impact of groundwater withdraws under the C-18 only is insufficient. Withdraws beneath the slough also have a definite impact on the river.
 37. **G-92 Culvert B** -- the reference to additional culverts (plural) on page 128 is questioned and the sentence following on 'operational criteria' needs clarification.
 38. **Vegetation** -- this section looks good but I need additional time to evaluate it and review the appendices. One observed inconsistency is noted between statements on the presence of saplings and seedlings near river mile 9.2 (see pages 116 and 135).
 39. **65cfs** -- the summary of the NPBCCWMP on pages 152 and 153 includes the statement 'provide supplemental water to maintain up to 65 cfs...' I thought the up to phrase was corrected before the plan was issued. As related elsewhere in the MFL document, the goal of the WMD remains on of 'continue to provide flows of 65 cfs or greater....whenever water is available'.
 40. **Water delivery** -- the narrative on page 157 relates to 35 cfs and 65 cfs. For consistency, the title of Table 42 should also list both flow goals.
 41. **Figure 34** -- this graphic on page 158 is very descriptive. Good job.
 42. **Salinity barrier** -- the paragraph on page 165 should include the effect of the biological community as well as salinity and other water quality issues.
 43. **Extreme dry conditions** -- several references in the report, including table 23 on page 97 and the summary on page 140, speak to the droughts of 1980-81 and 1989-90 in terms of full dry season averages. Other references, page 98 and table 24 evaluate shorter time frames within these droughts. The difference in average flow over an extreme two or three month spell and the average flow over the full six month dry season can be significant. Given that sixty days or less of very low flow can likely cause significant harm, placement of a greater emphasis on flows during dry periods of shorter duration is suggested.
 44. **Stormwater management** -- the enclosed Stormwater Management Plan was prepared for and accepted by the Management Coordinating Council about three years ago. The document inventories existing drainage systems, identifies problems and develops recommendations including the means to increase the duration of freshwater flows delivered to the river and reducing pollutant loadings. The evaluation of other basins on page 158 may benefit from this document.
 45. **SIRWCD improvements** -- The efficiency of delivering supplemental flows to the river will be enhanced with the implementation of new structures within the drainage canals. Perhaps this program could be discussed more completely.
 46. **Minimum flow criteria** -- the statement presented in the executive summary and on page 149 needs clarity &/or is incomplete in at least three respects. First, the use of 'mean monthly flows' is debated. How was this time frame established and, given flow variances, how can it be defended. Second, my question of last month is still unanswered. Is the 20-day period cumulative or consecutive? If it is intended to be consecutive, additional criteria will be needed to protect the river. The third matter relates to the

establishment of an absolute floor. Given that the salinity moves upstream within a matter of days, flows of less than 20cfs?? (pick a number) should be disallowed.

47. **Exclusions** -- the staff suggestion that it is not appropriate to apply the exclusion regarding historic functions is extremely subjective and has no basis in fact or support from technical information. To see this statement in the middle (page 72) of a scientific document is concerning.
48. **Water reservations** -- on page 164, the sentence 'the first reservation of existing water for the Loxahatchee River should be made within on year after Governing Board approval' would be more meaningful with two clarifications. What is meant by existing water, is it part of or in addition to the 35 cfs? And, Governing Board approval of what (the MFL) will trigger the reservation process?
49. **Research needs and monitoring** -- as relates to the currently proposed MFL and future MFL work in the freshwater and estuarine portions of the system, research and/or continued monitoring in the following areas is suggested. Submerged aquatic vegetation, macroinvertebrates, nutrients and trophic state and dissolved oxygen in the upper reach of the northwest fork.